

**REACTOR SYSTEM INCLUDING AUTO IGNITION
AND CARBON SUPPRESSION FOAM**

ABSTRACT OF THE DISCLOSURE

A reactor system including a reactor housing having an inlet portion defined at one end of the housing and having a discharge opening formed in the housing at an opposite end. An air intake charge line is connected to the housing for charging air into the inlet portion. A steam charge line is connected to the housing for charging steam into the inlet portion. A fuel injector is positioned in the housing for injecting fuel into the stream of air and steam flowing through the housing. A fuel charge line is connected to the fuel injector for charging a carbon-based fuel into the injector. A catalyst bed is carried in the housing and positioned downstream of the fuel injector and at least a portion of the catalyst bed includes a catalyst for promoting the reformation of the carbon-based fuel to produce hydrogen. An auto-ignition and carbon-suppression foam is carried in the housing and positioned between the catalyst bed and the fuel injector.